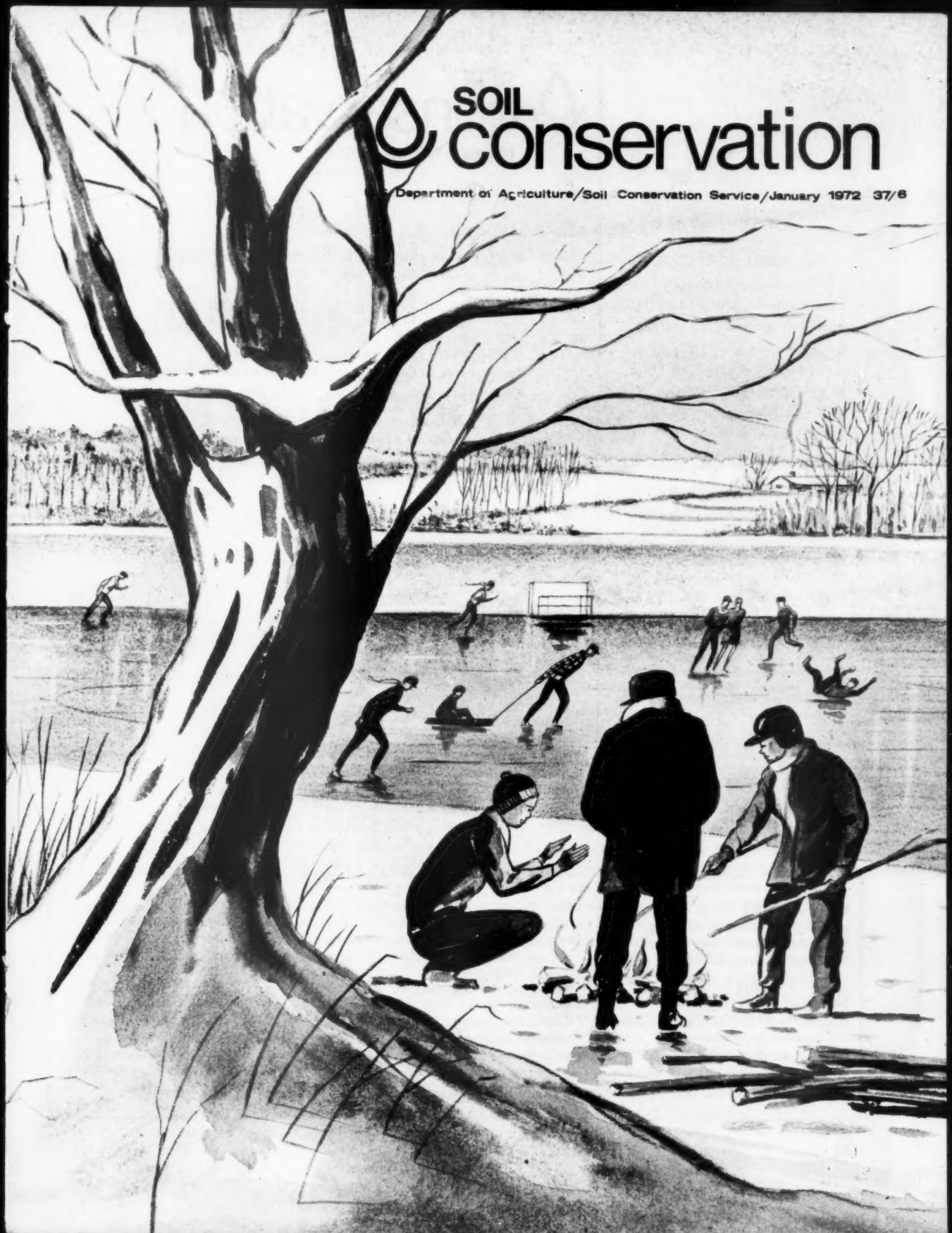
SOIL
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SOIL conservation

January 1972, Vol. 37, No. 6

This month SOIL CONSERVATION looks to the past and to the future. Our annual report tells of last year's efforts by SCS in improving the quality of human environment. And a year-end roundup sums up SCS activity or accomplishments in each state during 1971.

SCS has been re-thinking its mission and programs as evidenced by a framework plan, which is the subject discussed in an interview with SCS Administrator Kenneth Grant by Hubert Kelley.

COVER: An original drawing done specially for SOIL CONSERVATION by Felix Summers, technical illustrator at SCS's Midwest Regional Technical Service Center, Lincoln, Nebraska.

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A framework plan for the Soil Conservation Service

An interview with Kenneth E. Grant, Administrator, Soil Conservation Service

In October 1971, the Soil Conservation Service published a key document: "Soil and Water Conservation for a Better America . . . A Framework Plan." The result of 2 years' work by a number of experienced SCS people, this plan represents an attempt to look ahead to the mission and future activities of the soil and water conservation program in America. Shortly after publication of the plan, SCS information director Hubert Kelley questioned Administrator Kenneth E. Grant on the plan—how it came to be written, how it can be used, what it means to the future of the Service. The interview follows:

Question: Mr. Grant, why did you feel it necessary to develop a framework plan for the Soil Conservation Service after nearly 4 decades of SCS operations without one?

Grant: The Service, like every other organization these days, is caught up in a period of rapid change. We frequently find ourselves altering course in midstream without carefully thought-out goals and guidelines. Because I don't think this is a very good way to run an organization, I asked the state conservationists and others familiar with our work to try to agree on a framework plan to help us chart the course of the Service for the next 10 years—or even longer.

Question: What are some of the more significant changes that led you to take this step?

Grant: Many changes are taking place in social values today that are resulting in a

different ordering of priorities. We have become a more discriminating society with higher expectations for a quality life. This has resulted partly from greater purchasing power linked with more leisure time. Americans today are demanding a better balance between material needs and quality surroundings. This leads to a closer scrutiny of the condition of our natural resources and their impact on environmental quality.

Question: Could you cite specific examples of these changes that have had a particular impact on the work of the Service?

Grant: One example is the increased emphasis on pollution. Until a few years ago, sediment wasn't even recognized in many circles as a water pollutant. I felt that SCS, as the USDA agency responsible for soil and water conservation, had an important role to play in the water-quality field. Another change is the increase in livestock feedlots and the water pollution that results from the runoff. This problem came into focus very quickly, and SCS was forced to adapt its techniques to help solve it without the research and field experience that we like to have before we move into a new area. A third change is the growing need for soil survey information by urban planners and developers. You can't change a complex program like the soil survey overnight.

Question: But the Service actually was being pulled into these fields before you had a plan. How does a framework plan change things?

Grant: Too often we have just been reacting to situations instead of looking ahead and coming up with well considered, reasonable guidelines for the future. The framework plan will mean the difference between acting and reacting. It will help us put the soil and water conservation job in perspective—to look at the major components of the job and how they interact and relate to the total.

Question: With technology changing so fast, I should think it would be harder than ever to look into the future with any assurance.

Grant: Well, I would be naive if I thought the Service could look ahead with clarity into 2 or 3 decades. I don't believe any such thing, of course. But I do insist that you have to make the best projections and forecasts you can to guide your future actions, and try to think things through rationally, and not just wait until a problem hits you right between the eyes.

Question: The published plan contains 79 pages. Can you describe it very briefly?

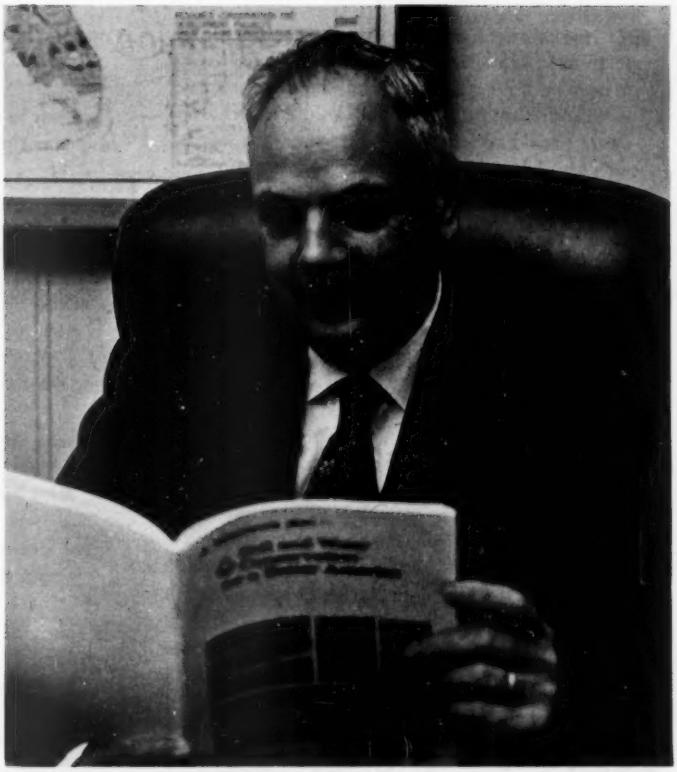
Grant: The first few chapters discuss the social setting, the economic basis, and the anticipated need for soil and water conservation. Chapters 5 and 6 are key chapters; they describe the Service's mission and goals and the thrust that future SCS actions should take. In all, the plan contains 67 major goals, and each is discussed in some detail. Chapter 7 goes into some of the institutional arrangements that will need attention as the plan is implemented. To put it as simply as I can, it is a framework plan that relates our mission objectives to the supply and condition of natural resources and to the benefits that must be achieved to meet quantity and quality goals. It sets forth goals and future needs for changes in resource use and improvement in resource management. It states the goals and broad policy and plans for SCS program activities that hopefully will lead to these changes and to improvements in resource management.

Question: What does the plan foresee as the mission of the Service in the years ahead?

Grant: At the outset, the plan states that the mission of SCS is to assist in the conservation, development, and productive use of our soil, water, and related resources so that all Americans may enjoy, first, quality in the natural resource base for sustained use; second, quality in the environment to provide attractive, convenient, and satisfying places to live, work, and play; and third, quality in the standard of living based on community improvement and adequate income.

Question: Why all this emphasis on quality today?

Grant: We have reached a point in this country where a high proportion of people have good homes, good jobs—many of the amenities of life. A lot of people have achieved many of their material goals. Now they can devote more of their energies to improving the quality of life—quality of education, quality of medical care, quality of the environment. While SCS is still very much concerned about the quantity of our resources, our framework plan also takes note of this new national con-



Kenneth E. Grant, Administrator, Soil Conservation Service

cern for quality. But really our mission embraces both quantity and quality aspects just as it always has.

Question: What do you see as the basic job of Service people in trying to achieve these missions?

Grant: Our basic role is professional assistance that helps users of soil and water resources to plan alternatives that lead to prudent decisions for preventing or correcting misuse of soil and water resources, for developing these resources with full consideration for future needs, and for improving resource management to meet quality standards and updating resource management to accommodate new technology and equipment.

Question: Have Service people in the past showed themselves able to adapt to change?

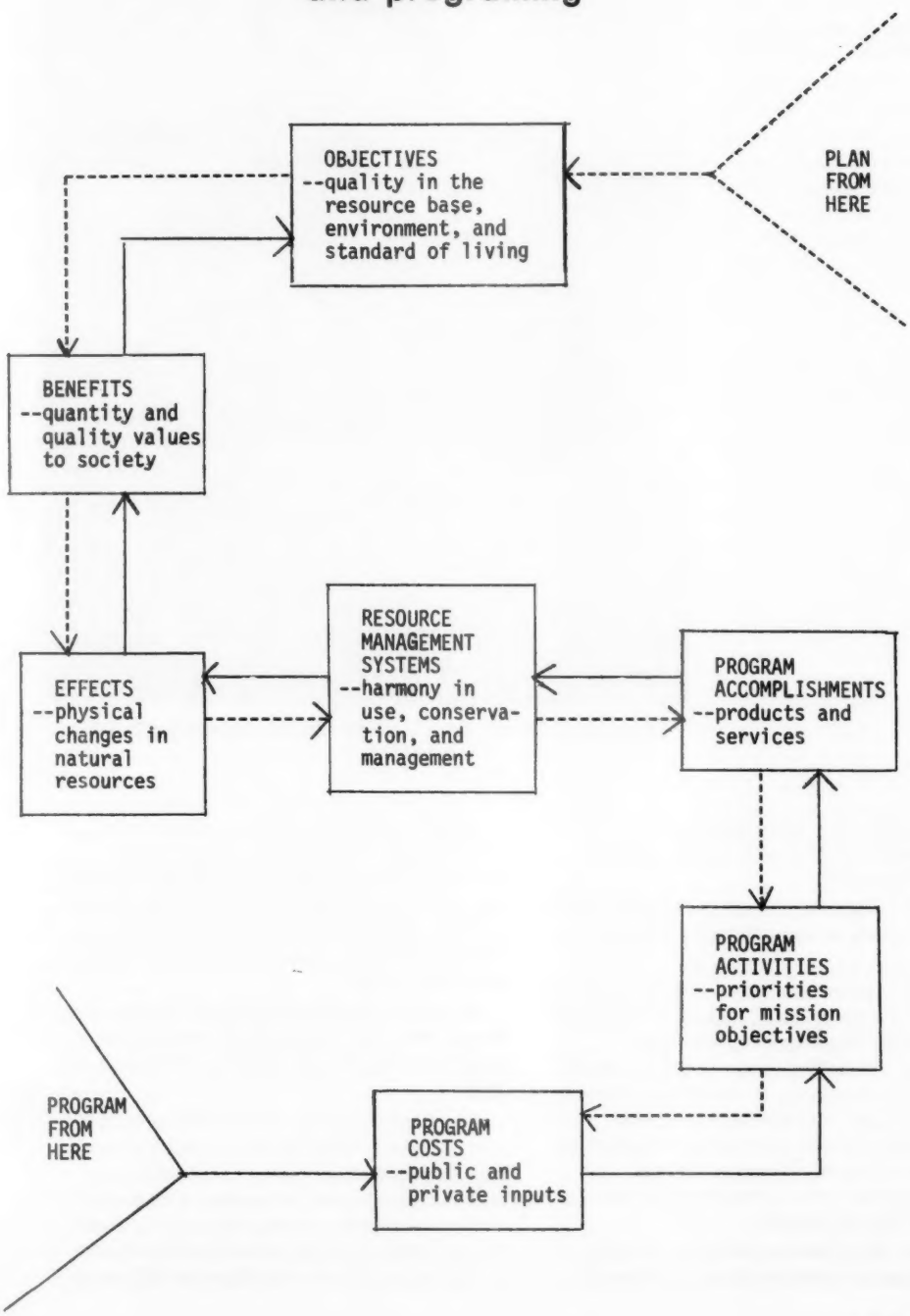
Grant: They certainly have. They have always been very quick to recognize new opportunities to be of service. The SCS program has never stopped growing in scope and complexity. Each year our conservation activities benefit a broader segment of society—both rural and urban.

Question: But with 67 different goals—even though they are related goals—won't field people run the risk of spreading themselves too thin?

Grant: Our people will continue to look to conservation districts to help establish priorities. Together they are going to have to pick and choose those areas in which their efforts will be most productive in meeting high priority needs. It's also part of our job within the Department of Agriculture to help identify what SCS can be

FRAMEWORK IN ACTION—

a model for soil and water conservation planning and programing



expected to accomplish—and what it cannot. Certainly we can't be all things to all people and still perform a quality job.

Question: How can you be sure of getting highly qualified people in changing times like these?

Grant: One way is by keeping our professional standards high. Another is through continuous retraining. You've heard it said that half of what you learn in college is outdated in 10 years. It won't be long before it's outdated in 5 years. That means we'll have to keep sending our employees back to "school"—to brush up on old disciplines and to master new ones.

Question: Thirty years ago, it was possible to hire people with a strong commitment to the conservation ethic. Can you still find such people today?

Grant: Absolutely. More than ever. And it's that commitment that will make this plan a living reality.

Question: The plan foresees an increase in SCS responsibilities in surveying and monitoring. What's so important about these?

Grant: Surveying and monitoring provide data and information about the extent, condition, and rate of change of soil, water, and related resources. It is essential to make periodic surveys and inventories and to monitor the changes taking place in the resource base so that people can make intelligent decisions about resources. Monitoring is a continuous overview of what is actually happening to resources. Monitoring data can be used to relate the past and present conditions of natural resources to quality standards so decisions can be made that provide for quality on a sustained use basis. The gap existing between the actual conditions of natural resources and quality standards indicates to a major degree the magnitude of the soil and water conservation job ahead.

Question: Does the Service have the expertise to assume increased responsibilities for surveying and monitoring?

Grant: I think our people have training second to none in looking at the supply and condition of natural resources and determining what the impact will be when you interject a new force or change into the environment. One example is the annual SCS estimate of land and acreage subject to damage by wind erosion in the Great Plains. Or you could talk about the snow survey, or the Conservation Needs Inventory, or the soil survey, or studies of large river basins. Our people are experienced. We have an excellent base for developing methods and techniques for monitoring other significant changes in natural resource conditions.

Question: Are you overlooking the experience of farmers and ranchers?

Grant: Certainly not. SCS's more than 14,000 employees draw on the experience of 18,000 district directors or supervisors and more than 2 million district cooperators. I remember one farm that had been in the same family since a king's grant in the 1600's. The owner can tell me the sequence of crops and the successes and failures associated with that piece of land for over 300 years. You can't beat experience like that.

Question: The "framework" also predicts a bigger role for SCS in the planning field. Isn't this a new departure for the Service?

Grant: Far from it. In working with individual farmers and land users, we have always insisted that the proper approach to conservation is to develop a conservation plan, rather than attacking problems piecemeal.

Question: But now we're talking about towns and counties and states and even regions.

Grant: True, but we are already proceeding in the same way in this larger area. Our role is to supply both the land users and the professional planner and decision makers with basic information about the probable results of alternative land uses and resource management.

Question: The plan sets forth several planning principles; the first calls for citizen involvement. Why is this so important?

Grant: Some people may disagree, but in my opinion the finest plans are those in which local citizens have participated from the outset. Any plans you work out in isolation today have little chance of succeeding. They are simply exercises in frustration.

Question: Another principle is "interaction." What does that mean in plain English?

Grant: It means that everything you do

about resources interacts in some way with something else. You can't take any action in the environment without setting off a whole series of effects. We're saying that you have to consider these second, third, and even fourth order effects today before you take that first action.

Question: The third planning principle the plan talks about is "flexibility." Isn't that a temptation to give wishy-washy advice?

Grant: No, I don't agree. If anything, our people have occasionally been too inflexible in giving advice to land users. In a country as big as ours, you need enough leeway to respond to change. Who would have predicted just a few years ago the emphasis today on land for recreation, for wilderness, for transportation, or for new towns? We want enough flexibility in our planning to enable people to respond to different sets of conditions—5, 10, or 15 years down the road.

Question: With so many people involved in the planning process these days, the SCS role in planning must be confusing to many employees. Will this plan help clarify things?

Grant: I agree that planning can be extremely complex. But in the framework plan, we have set forth—to the best of our ability at the present time—those important areas in which the Service needs to get more involved and the general guidelines for getting the work done. The plan gives an employee something to relate to in doing his work.

Question: But do you honestly think any plan can be broad enough to meet the needs of such widely disparate areas as, say, Massachusetts or Montana?

Grant: I'm personally convinced that our own plan is that broad. It was developed by people with a full range of experience in various types of locations around the country. This plan has built-in flexibility to meet changing conditions and needs in different locations, whether Maine or Florida or California. The only difference between geographic areas will be the relative importance of goals and future needs and the institutional arrangements that exist for soil and water conservation activities. This is one reason for calling it a "framework plan."

Question: How does this plan tie into "The Future of Districts," published by the National Association of Conservation Districts Outlook Committee?

Grant: The crosswalk between our plan and the district outlook publication will be evident to anybody who reads both of them. Both documents envision a broadened role for districts and the Service. They are entirely compatible. They provide guidance that can make the SCD-SCS partnership even more effective.

Question: Who will be responsible for implementing the plan? The state conservationists?

Grant: The state conservationists helped develop the plan, and they certainly will be using it to guide their operations. But we also will implement the plan at the national and local levels.

Question: And how about the district conservationists?

Grant: The district conservationists will not only have to read the plan but also think about it and discuss it with their colleagues. When you have 3,400 office locations—most of them headed up by a district conservationist—then obviously the success of the plan is entirely dependent on the understanding, participation, and commitment of the district conservationist. With this document, we have established communication of our goals up and down throughout the Service—with our staff people—and from my office through the state conservationist and area conservationist to the district conservationist and the people he supervises. The only way that we can ever hope to achieve the commendable objectives set forth in this plan is to achieve in every Service office a complete understanding of what it contains.

Question: But won't the district conservationist have to be a "super-generalist" to make use of this plan—part agronomist, part sociologist, part ecologist, part soil scientist? Can we expect all this from one person?

Grant: Certainly. The typical district conservationist has been operating very well in many of these fields right along. Of course, we have national, regional, and state specialists on hand to help him, but I think he does very well in his own right. This plan is going to help him even more. ♦

It was a very good year

Summary of activites of the Soil Conservation Service for fiscal year 1971

During 1971, the Soil Conservation Service placed increased emphasis on efforts to improve the quality of living in rural communities and to increase job opportunities through resource development and management, to plan conservation on an areawide basis, and to implement the growing desire of Americans to keep their country beautiful and healthful.

A significant development in this respect was the completion of a framework plan, *Soil and Water Conservation for a Better America.* This plan will guide the Soil Conservation Service in the decade ahead in its mission of assisting in the conservation, development, and productive use of the nation's soil, water, and related resources and thus helping to improve the quality of human environment.

The plan can be useful not only to people with responsibilities in the environmental field within the federal government but also to soil conservation districts, state resource agencies, and private conservation organizations. Its framework is applicable to any part of the country. What will vary from area to area and community to community is the mix and importance of future needs and goals.

The plan comprehensively lists SCS activities under seven categories: resource technology and development, surveying and monitoring, resource conservation planning assistance, installation and maintenance assistance, information support, management support, and international assistance. In 1971 significant progress was made in each of these activities.

Resource technology and development

Changes in land use and management, in equipment, in plants and fertilizers, and in life styles make it necessary to update and improve conservation technology.

Agricultural waste management

Public demand for a quality environment plus enforcement of more rigid air- and water-quality regulations brought rapid advances in agricultural waste management in 1971. The basic concepts—divert clean water, grade feedlots and barnyards, intercept polluted runoff, and treat or utilize the runoff and solid wastes—remain the same, but techniques are constantly being improved.

Drying and refeeding manure mixed with other rations is being tried on cattle, poultry, and hogs. Equipment to compost manure for subsequent sale as an organic fertilizer and soil builder has been developed and is being used successfully by some large beef-cattle enterprises. Experiments are being conducted using the common housefly to process or biodegrade manure. Mechanical aeration techniques are being refined to assist nature in degrading wastes in lagoons. Waste-handling equipment is being developed or modified to improve management of both liquid and solid wastes.

Recycling agricultural wastes to the land and its plant cover remains the most successful method for ultimate disposal.

Soil data

SCS continued to use automatic data processing technology to improve the processing of data about soils. Already operational is a system dealing with soil taxonomy. Under development are systems for rapid preparation of data for soil survey manuscripts and for making substantially more use of interpretative soil data that relate directly to use and management of our soils as a national resource.

Also operational is the Gerber automatic drafting machine. This machine, designed to draft press-ready negatives of soil maps, is presently being used for precision drafting of control and acreage grids and photographic line screens. Under development is a system for drafting digitized maps at any selected size up to 5 feet by 8 feet.

Plant materials

A creditable number of new plants were released by SCS plant materials centers and their cooperators during 1971. They were distributed through state crop-improvement associations and soil conservation districts and are now in commercial production. Some of the new plants are:

Barton western wheatgrass — from Kansas, for improved forage and soil stabilization.

Bend sand lovegrass—from Kansas, an outstanding variety adapted to sandy soils in south central Kansas and north central Oklahoma; for grazing and soil stabilization.

Mason sand lovegrass — from Texas, vigorous and leafy, well adapted to sandhill areas; for forage and stabilization.

Cape American beachgrass — from New Jersey, outstanding vigorous clone; for tying down eastern coastal sand dunes.

Critana thickspike wheatgrass—from Montana, a stabilizing plant for such critical areas as airports, industrial parks, and highway banks.

Marshfield big trefoil — from Oregon, a new vigorous strain adapted to wet lands; for pasture or use as a legume in seepy critical areas.

Arnot bristly locust—from New York, adapted to much of the eastern half of the United States; for stabilizing, screening, and beautifying acid mine spoils, highway banks, and sterile borrow areas.

Rem-Red Amur honeysuckle—from New Jersey, provides late winter "raisined" food for songbirds; its bright red berries are highly ornamental through fall and early in winter.

Surveying and monitoring

Surveying and monitoring provide resource information needed in research, in establishing resource use policies, and in planning resource management systems.

Soil surveys

SCS continued to accelerate the publication of soil surveys. In fiscal year 1971, 60 were sent to the printer—the most ever in any one year (40 soil surveys were sent in FY 1970). Also, 1,074 special soil-interpretation reports were prepared and made available for local use. In FY 1970, 529 similar reports were prepared.

The demand for soil surveys and the ways in which they are used continued to increase. More and more urban planners, developers, and engineers used soil surveys and soil maps to avoid the costly mistakes that can result from building houses, schools,

factories, and roads on soils having severe limitations for these purposes. Soil interpretations were broadened to better serve the multifarious users.

Conservation Needs Inventory (CNI)

The *Basic Statistics* of the 1967 Conservation Needs Inventory was published in January 1971. In November a color brochure on the CNI, *Two Thirds of Our Land,* was sent to the Government Printing Office. In addition, publication of a comprehensive interpretative report is being considered.

Forty-two individual state CNI reports have been received plus a number of brochures on state and county findings. County data are also being published, and some states report that all counties have issued reports.

The 1967 CNI data already in the data bank are being reviewed, certain entries are being corrected, and soil names are being introduced to increase the effective use of the data. It is proposed that soil interpretations for each kind of soil listed in the CNI data bank be added to the CNI data file. Four pilot states —Ohio, Indiana, Kansas, and Nebraska — are testing procedures.

Monitoring—natural resources

The Soil Conservation Service continued in the development of a natural resource monitoring capability. This was made necessary by the accelerated planning at local and state levels of government, especially in areas of critical environmental concern and those areas of high-intensity land use or rapid change in land use.

As set forth in the SCS framework plan, remote sensing developments will become increasingly important in resource monitoring. USDA is watching and evaluating developments in remote sensing and is planning to participate modestly in testing selected outputs from the first Earth Resources Technology Satellite (ERTS) scheduled for launching by NASA next spring.

In 1971, the Soil Conservation Service voluntarily developed and put into action a nationwide program to support efforts to preserve and protect rare and endangered species of plants and animals. This program places the SCS field force—cooperating with concerned agencies and groups—on the lookout for habitat changes, land use changes, or other changes in the landscape that may affect the rare species adversely. SCS people notify proper state and federal authorities when this takes place.

Monitoring—snow and water supplies

The Soil Conservation Service Snow Survey and Water Supply Forecasting Program continues to grow in popularity in the Western States. It is a good example of cooperative effort—37 percent of last year's program was paid for by cooperating agencies.

New uses for snow survey data were found, including evaluating potential for winter sports areas and predicting snow loads for design of structures. Snow survey data have long been used in predicting irrigation supplies and power generation. Snow precipitation was monitored for some of the Bureau of Reclamation studies made of weather modification through cloud seeding.

Snow survey data are finding a use in water management for pollution control. With knowledge of predicted rates of streamflow available, assimilative capacity of streams can also be predicted and allowable rates of waste discharges determined in advance.

Resource conservation planning assistance

Revitalizing rural America continued to be one of the most important facets of Soil Conservation Service work during 1971. The goal of this effort is to build, through the development and use of soil, water, and related resources, a more prosperous and more attractive rural America with full opportunity for the social and cultural development of people, for higher per capita and family income, for more adequate community facilities, and for stopping the rural-to-urban migration of population.

Rural development involves change, and SCS programs are designed to bring about change. Change may come in terms of increased employment opportunities and higher incomes. It may mean a new water-supply system or other community facilities. Change may include development of a lake or stream for recreational use. And it may come in the form of institutional developments for training or retraining people in the skills and arts demanded by society.

National and regional

SCS assisted in developing policies and plans for achieving national soil and water conservation objectives. It continued to give priority to regional planning

that considers the conservation and safe use of land and water resources and that facilitates state and local resource planning.

State and area

Watershed projects. The watershed program, one of the early efforts of Congress toward environmental improvement, was designed originally to help local sponsoring groups control erosion, reduce sediment, and prevent floods. Water supply, recreation, fish and wildlife, and other multiple-purpose features are added benefits that provide a means for people to meet broad and positive community aims. Watershed projects also bring many new jobs to rural towns.

During the fiscal year, federal assistance was furnished to sponsors of 1,045 projects. Initial agreements for construction were signed for 36 projects located in 22 states, bringing the total to 760 projects that have entered the construction stage. Sponsors of 323 projects had completed the construction of all measures by the end of 1971. A total of 306 projects have now completed all planned construction and related land-treatment work.

Local sponsors submitted 85 new applications for assistance during the fiscal year. Planning assistance had been authorized for a total of 1,622 projects by the end of the year, leaving a backlog of 1,309 unserviced applications.

A total of 1,045 projects were approved for Department help. And 42 plans were awaiting approval by Congressional committees at year's end.

The multiple-purpose concept is strongly reflected in projects planned during fiscal year 1971. Of the 1,045 plans approved for operations, 58.6 percent included more than one purpose.

Resource conservation and development projects. In September 1971, 20 new RC&D projects, covering nearly 72 million acres in 133 counties in 21 states, were authorized for planning assistance by the Department of Agriculture. This addition brought the number of projects underway across the country to 98, covering 372.5 million acres. The Department recognizes resource conservation and development projects as a real force in meaningful rural and community development.

The objective of RC&D projects is to improve the use of the project area's natural resources and the economic and social conditions of its people. Each RC&D project covers an area where the potential is high for boosting income and increasing community facilities.

The Little Colorado River Plateau Project, for example, covers the Hopi Indian Reservation, the Navajo Indian Reservation (Arizona), and two northeastern Arizona counties — 16.2 million acres. Its headquarters are in Holbrook, Ariz. Project goals include stabilizing the livestock industry through improved range vegetative cover, development of water and timber resources, improvement of sewage treatment and disposal, introduction of specialty crops, improvement of transportation facilities, establishment of markets for the area's farm products, and development of new recreational areas. Sponsors include the Hopi and Navajo Tribal Councils.

SCS provided leadership in fiscal year 1971 in moving forward more than 7,000 project measures. More than 1,100 of these were completed during the year. Project measures are aimed at solving a wide variety of problems in agriculture, forestry, industry, employment, and community facilities.

Units of government

More than 22,800 units of state and local government received help from SCS in 1971. SCS provided 10,931 resource inventories and evaluations to planning commissions or other agencies of local or state government. It made field investigations and recommendations on land use and treatment of proposed sites for 2,042 public facilities such as schools, hospitals, sanitary landfills, transportation facilities, recreation areas, and water and sewer facilities.

In 1971, SCS responded to increasing requests from local and state governments for resource data essential to developing land use and treatment ordinances. Four hundred and sixty-nine land use regulations, zoning ordinances, sanitary codes, and building codes or standards were issued or enacted by government bodies, using soil surveys and other technical information provided by SCS.

An increased number of community and regional planning workshops were conducted for SCS personnel to help increase their contribution to local comprehensive planning programs. A specialist in community and regional planning was added to the national staff to intensify the Service's efforts in this important field.

SCS participated in a series of joint meetings with several chapters of the American Institute of Planners. These meetings helped give professional planners a better understanding of the planning capabilities available from SCS on land use and conserva-

tion treatment. Such contacts have led to SCS personnel being assigned to full- or part-time service on the staff of regional planning commissions.

Group and individual

During 1971, the Soil Conservation Service continued its planning assistance to individual land owners and users cooperating with the more than 3,000 soil and water conservation districts throughout the country. SCS also sharply increased help to groups and organizations ranging from two or three land owners to many land owners forming large single interest and multi-interest associations. SCS people helped prepare nearly 70,000 conservation plans covering more than 28.7 million acres and helped revise 32,393 plans covering more than 20.3 million acres. More than 586 million acres of private land in the United States now are covered by conservation plans that insure resource protection and proper land use.

Great Plains Conservation Program. Severe drought struck the Southwest in 1971, and the excessive damage to farms and ranches in the Great Plains Region points to the necessity for the high priority that SCS gives to the Great Plains Program. Through long-term contracts under the Great Plains Program, farmers and ranchers apply needed conservation treatment on their land in the 453 designated Great Plains counties. Priority is given to cropland that is unsuited for sustained cultivation but is still used for that purpose. About 20 percent of all cropland in Great Plains Conservation Program contracts is planned for conversion to rangeland.

In 1971, 2,368 farmers and ranchers placed more than 4 million acres under Great Plains Program contracts. More than 40,000 farmers and ranchers now either have completed or have underway contracts for conservation treatment of more than 72 million acres.

Wind erosion in the Great Plains reached a 14-year high last season—the 4.7 million acres damaged indicating the worst years since 1956-57 when 10.3 million acres underwent extensive soil movement. The erosion marks a serious increase from the all-time low of 995,150 acres damaged in 1968-69. An SCS survey showed 2.7 million acres of land damage in west Texas alone. Most of this season's damage was on lands insufficiently protected by the residues of the previous year's crops. Emergency tillage was effectively used to protect 3.9 million acres.

Installation and maintenance assistance

Conservation districts, by the end of fiscal year 1971, had more than 2.2 million cooperators who were applying and maintaining soil and water conservation practices on 766.5 million acres.

SCS recognizes that conservation measures must be carefully planned, installed, and maintained. SCS provides onsite technical assistance for applying measures if needed to insure quality control and to implement new techniques. In FY 1971, SCS provided 2.9 million technical services to 1.1 million individual land owners and users in conservation districts.

SCS will continue to assist units of state and local government, private organizations, and land users in inspecting completed work and in maintaining resource management systems according to quality standards.

Management support

In 1971, the Soil Conservation Service reviewed all of its program policies and procedures to insure appropriate steps to bring about maximum environmental quality enhancement in its work. For example, revegetation and other sediment-reducing measures are applied concurrently with or immediately following all soil-disturbing conservation operations under direct control of SCS.

International assistance

The Service's international reputation for soil and water conservation expertise continued to generate requests for assistance from developing countries. In 1971, SCS had 20 top field specialists in India helping with water-management demonstration projects. Three men were assigned to Nigeria, two to Tunisia, and one to Thailand to assist with soil and water conservation programs. Short-term consultants were assigned to Brazil and Argentina under an agreement with the Organization of American States. And a number of other nations requested and received help in solving their soil and water conservation problems.

During the year the Service assisted 407 individuals coming from 40 countries to observe and gain experience in various aspects of soil and water conservation. ♦

Summary of Progress, Fiscal Year 1971

Total reportable progress in soil and water conservation programs assisted by the Soil Conservation Service

Progress items	Total reportable progress	Cumulative to June 30, 1971
Conservation plans and related services		
District cooperators ..... No.	86,792	2,237,093
" " ..... acres	33,190,135	766,515,440
Cooperators canceled ..... No.	56,724	—
" " ..... acres	20,326,594	—
Recipients of technical assistance ..... No.	1,130,377	—
Technical services ..... No.	2,942,006	—
Recipients applying practices ..... No.	673,972	—
Special mapping for planning and CNI ..... acres	8,890,428	291,079,767
Conservation plans prepared ... No.	69,863	1,763,067
" " " ... acres	28,794,134	586,357,175
Conservation plans canceled ... No.	42,879	—
" " " ... acres	15,709,193	—
Conservation plans revised ... No.	32,393	—
" " " ... acres	20,393,049	—
Inventories and evaluations prepared ..... No.	49,766	—
Federal lands in coordinated conservation plans ..... No.	145	1,109
" " " ... acres	2,132,928	13,304,984
State and county CNI reports ..... No.	230	—
Resource planning and implementation		
Services on resource plans ..... No.	76,753	—
Units of government assisted ..... No.	22,838	—
Resource plans prepared ..... No.	1,204	—
Inventories and evaluations for resource plans ..... No.	10,931	—
Land use regulations established ..... No.	468	—
Site selection for public facility ..... No.	2,042	—
Operating units		
Total operating units ..... No.	—	4,478,433
" " " ..... acres	—	1,386,509,910
Other land units ..... No.	—	4,187,682
Resource planning units ..... No.	—	82,874
Group plans, services, and installation plans		
Group plans prepared ..... No.	2,967	11,897
" " " ..... acres	2,327,782	12,889,658
Group inventories and evaluations ..... No.	4,293	57,150
" " " ..... acres	4,740,812	49,774,425
Groups assisted ..... No.	12,559	—
Services to groups ..... No.	77,098	—
Groups applying practices ..... No.	4,246	—
Great Plains Conservation Program		
GP applications received ..... No.	3,689	45,956
" " " ..... acres	7,147,310	88,447,657
GP applications canceled ..... No.	1,406	—
" " " ..... acres	1,694,344	—
GP contracts signed ..... No.	2,368	40,147
" " " ..... acres	4,098,454	72,092,334
GP contracts terminated:		
By mutual consent ..... No.	105	1,208
" " " ..... acres	157,337	1,705,995
For cause ..... No.	37	862
" " ..... acres	40,725	794,185
By expiration ..... No.	3,361	20,793
" " ..... acres	6,193,892	34,990,421
(Total terminations) ..... No.	(3,503)	(22,863)
" " ..... acres	(6,391,954)	(37,490,601)
Cropland before GP contract ..... acres	708,495	11,178,776
Planned cropland conversions ..... acres	144,491	2,250,930
Servicing other USDA programs		
Referrals serviced:		
REAP—F. Y. 1971 ..... No.	256,992	—
" —P. Y. 1970 ..... No.	—	285,909
Cropland Adjustment Program ..... No.	28	—
Appalachian Program ..... No.	1,263	—
Conservation plans approved ... No.	2,173	—
Soil surveys		
Detailed soil surveys ..... acres	36,905,054	748,226,618
Reconnaissance ..... acres	1,067,947	30,104,829
(Total surveys) ..... acres	(37,973,001)	(778,331,447)
Soil conservation surveys ..... acres	—	23,606,919
Soil conservation surveys canceled or converted ..... acres	1,278,922	—
Snow surveys and water supply forecasting		
Snow course measurements ... No.	6,659	—
Aerial snow marker readings ..... No.	960	—
Mountain precipitation gage readings ..... No.	1,790	—
Soil moisture station readings ..... No.	1,417	—
River stations for which numerical forecasts issued ... No.	465	—
Numerical forecasts issued ... No.	2,055	—
Recreation developments		
Land owners and operators who have:		
Established their first commercial recreation enterprise ... No.	1,556	60,055
Expanded or added to commercial recreation enterprises ... No.	955	—
Changed to recreation enterprises as their primary source of income ..... No.	195	10,778
" " " ..... acres	51,743	2,241,752
Private noncommercial recreation facilities established or expanded ..... No.	32,296	549,150
Public recreation facilities established or expanded ..... No.	524	37,493
Watershed and RC&D project measures		
Reservoir type structure sites investigated ..... No.	434	—
Flow control structure sites investigated ..... miles	600	—
Reservoir type structure sites surveyed ..... No.	483	—
Flow control structure sites surveyed ..... miles	903	—
Public fish, wildlife, and recreational developments:		
surveyed ..... No.	25	—
designed ..... No.	23	—
under construction ..... No.	20	—
Reservoir type structures designed ..... No.	745	—
Flow control structures designed ..... miles	608	—
Services provided on land rights agreements and contract awards ..... No.	23,023	—
Reservoir type structures under construction ..... No.	1,298	—
Flow control structures under construction ..... Miles	1,033	—

Summary of Progress, Fiscal Year 1971

Total reportable progress in soil and water conservation programs assisted by the Soil Conservation Service

Practices	Total reportable progress	On the land June 30, 1971
Bedding ..... acres	48,029	687,888
Brush control ..... acres	4,049,869	48,250,604
Chiseling and subsoiling ..... acres	732,207	7,522,499
Clearing and snagging ..... miles	954	6,549
Commercial fish ponds ..... acres	10,309	59,198
Conservation cropping system ..... acres	21,991,680	198,453,695
Contour farming ..... acres	3,368,473	48,713,298
Critical area planting ..... acres	148,207	4,757,980
Crop residue management ..... acres	20,528,863	165,561,626
Dam, diversion ..... No.	396	27,055
Dam, multiple-purpose ..... No.	275	6,001
" " " acre-feet	140,760	12,983,450
Debris basin ..... No.	1,711	86,181
Deferred grazing ..... acres	12,723,086	71,500,937
Dike ..... miles	326	10,973
Disposal lagoon ..... No.	987	1,632
Diversion ..... miles	2,070	98,639
Drain ..... miles	25,455	804,895
Drainage field ditch ..... miles	5,971	181,201
Irrigation canal or lateral ..... miles	228	45,936
Irrigation ditch and canal lining ..... miles	976	26,866
Farmstead and feedlot windbreak ..... acres	38,335	723,468
Fencing ..... miles	4,198	452,930
Field border ..... miles	1,302	48,733
Irrigation field ditch ..... miles	1,534	125,504
Field windbreak ..... miles	4,061	90,789
Firebreak ..... miles	2,428	19,655
Fishpond management ..... No.	60,922	597,694
Fish raceway ..... feet	65,383	151,913
Fish stream improvement ..... feet	173,744	1,065,748
Floodwater diversion ..... feet	29,135	1,472,830
Floodwater-retarding structure ..... No.	360	10,859
" " " acre-feet	222,942	5,492,569
Floodway ..... feet	105,891	3,891,107
Grade stabilization structure ..... No.	10,297	223,066
Grassed waterway or outlet ..... acres	57,473	1,846,138
Grazing land mechanical treatment ..... acres	55,863	1,453,381
Hedgerow planting ..... miles	324	24,612
Hillside ditch ..... miles	50	3,334
Irrigation pipeline ..... miles	3,284	80,113
Irrigation pit or regulating reservoir ..... No.	1,121	48,795
Irrigation storage reservoir ..... No.	409	40,671
" " " acre-feet	19,269	9,515,639
Irrigation system, sprinkler ..... No.	4,281	126,616
Irrigation system, surface and subsurface ..... No.	4,822	150,448
Irrigation system, tailwater recovery ..... No.	1,015	14,485
Irrigation water management ..... acres	4,128,770	19,960,112
Land grading for drainage ..... acres	32,939	455,389
Land leveling for irrigation ..... acres	322,375	11,250,282
Land smoothing ..... acres	264,462	6,923,490
Livestock exclusion ..... acres	410,215	7,501,118
Main or lateral drainage ..... miles	5,715	352,393
Minimum tillage ..... acres	2,160,865	21,804,073
Mulching ..... acres	129,023	710,557
Pasture and hayland management ..... acres	10,984,159	59,396,600
Pasture and hayland planting ..... acres	2,964,395	66,643,838
Pipeline ..... miles	2,595	29,588
Planned grazing systems ..... acres	6,237,268	29,845,332
Pond ..... No.	49,305	1,813,320
Prescribed burning ..... acres	479,053	4,688,358
Proper grazing use ..... acres	66,625,877	239,320,806
Pumping plant for water control ..... No.	2,136	68,692
Range seeding ..... acres	478,369	15,170,743
Recreation area stabilization ..... acres	3,893	114,296
Recreation area improvement ..... acres	91,755	828,522
Recreation land grading and shaping ..... acres	55,311	330,251
Recreation trail and walkway ..... miles	490	7,654
Road, access ..... miles	2,382	18,056
Spring development ..... No.	4,209	122,710
Stock trails and walkways ..... miles	77	4,164
Streambank protection ..... miles	401	7,588
Stream channel stabilization ..... miles	22	719
Stream, open channel ..... miles	869	15,976
Stripcropping ..... acres	487,462	20,920,638
Structure for water control ..... No.	64,255	2,103,448
Terrace, basin ..... miles	163	1,993
Terrace, gradient ..... miles	9,962	750,051
Terrace, level ..... miles	7,805	385,258
Terrace, parallel ..... miles	7,113	76,277
(Total terraces) ..... miles	(25,043)	(1,213,579)
Toxic salt reduction ..... acres	45,258	1,561,331
Tree planting ..... acres	360,105	19,424,875
Trough or tank ..... No.	12,229	476,916
Waterspreading ..... acres	28,131	933,320
Well ..... No.	7,308	495,901
Wildlife upland habitat management ..... acres	5,451,597	29,305,663
Wildlife wetland habitat management ..... acres	466,069	3,936,767
Wildlife watering facility ..... No.	1,323	17,748
Woodland direct seeding ..... acres	18,438	571,422
Woodland improved harvesting ..... acres	1,405,043	30,373,605
Woodland improvement ..... acres	468,859	14,872,701
Woodland pruning ..... acres	35,150	122,690
Woodland site preparation ..... acres	212,530	4,186,246
Land treated		
Land adequately treated ..... acres	41,834,187	699,627,817
Land protected during development ..... No.	356	1,026
" " " acres	10,722	32,197
Land use conversions [1]		
Cropland to grassland ..... acres	991,943	24,739,822
Cropland to woodland ..... acres	62,891	2,793,891
Cropland to wildlife-recreation ..... acres	47,927	1,360,917
Cropland to "other" ..... acres	68,440	5,277,061
All other uses to cropland ..... acres	154,581	7,072,235
All other uses (except cropland) to wildlife-recreation ..... acres	418,614	7,802,916

[1] Conversions on the land June 30, 1971, are estimates of conversions since July 1, 1962.

1971: a year of achievement

In 1971, the tempo of SCS action was fast, and the level of achievement was high. SCS responded to different needs in different states: in New Jersey, developing land; in Washington, open space; in West Virginia, strip mines. And it coped with problems that are national in scope—urban conservation, for example, and disposal of animal wastes.

On the following pages, SOIL CONSERVATION presents a state-by-state roundup of major Service achievements during 1971. This roundup is by no means comprehensive, but it presents at least an overview of SCS activity in the second year of the seventies.

Alabama: Improving the environment through the use of animal-waste disposal lagoons was a high-priority program in 1971. SCS joined several other federal and state agencies in helping farmers install 138 lagoons. These provide disposal facilities for 13,500 animal units annually—175,600 tons of animal waste.

Alaska: Alaskans continued to show an interest in the need for revegetation for erosion control and esthetic purposes. Responding to requests, SCS provided vegetative and related treatment recommendations as well as onsite assistance to local, state, and federal agencies, private industry, farmers, ranchers, and other landowners.

Arizona: It was an RC&D year in Arizona. The Little Colorado River Plateau RC&D Project was approved for operations; the Cocopai RC&D Project was authorized for planning and was assigned a project coordinator; the Coronado RC&D Project was established and was assigned a resource conservationist; the Hohokam RC&D Project, though not yet approved for federal funds, completed several project measures. Work began in establishing the Lower Colorado RC&D Project for the western part of the state.

Arkansas: All SCS professional people received training in collecting and organizing conservation and resource development information. Each district now has color-coded maps to locate resource and conservation problems and to show soil limitations for various uses. The information is used extensively by city and regional planners.

California: This state put soil conservation districts squarely into the total resource field with legislation that, among other things, changed the name of the districts to resource conservation districts. The newly named RCD's and SCS can now offer total resource assistance to both urban and rural Californians.

Caribbean area: The Virgin Islands Environmental Protection Act was signed into law in 1971; it gives the Virgin Islands conservation districts authority to guide land grading and development on the islands. The Virgin Islands RC&D Project was approved for planning. In Puerto Rico a contract was let for flood control work on La Boquilla unit of the Anasco River watershed, the first construction of this kind ever started in the Caribbean. And the Puerto Rico Environmental Quality Board began referring development plans to conservation districts for review before approval.

Colorado: Cost-sharing of soil survey operations by state, county, and city governments amounted to $39,000 last year and will result in the survey of 334,000 acres that were not on the regular mapping schedule.

Connecticut: SCS developed a Natural Soil Groups System to help present soil survey information in an easily understood form. Soils are grouped by important properties and color coded for easy identification on a map. The system helps local units of government and individual landowners with resource and conservation planning. To date, maps have been prepared for 30 towns or about 500,000 acres.

Delaware: The Cooperative Soil Survey Program for the state was completed in

1971. Delaware now has soil survey data for every acre.

Florida: SCS designed and laid out 69 animal-waste disposal lagoons and gave technical assistance to 15 municipalities in disposing of sewage effluent on the land.

Georgia: The number of earthen raceway systems for raising channel catfish increased to 31 in 1971, and an additional 31 are under construction. These systems have produced up to 60 times the fish yield of a well-managed, comparably sized pond or lake.

Colorado—soil survey

Hawaii: Mounting concern about erosion and sediment problems led to the drafting of new grading ordinances in three of the state's four counties. The ordinances aim at reducing erosion and sediment damage from urbanizing areas. A major requirement makes a plan outlining soil conservation measures a prerequisite to obtaining a grading permit.

Idaho: An isotopic snow gage was established on top of the Mount Baldy snow course at Sun Valley, Idaho. The printout of the snowpack will be prepared by the Aerojet Nuclear Corporation in Idaho Falls under contract with the Atomic Energy Commission and the SCS snow survey office in Boise. Because an isotopic snow gage measures compaction and stratigraphy as well as water content of snow, SCS snow data will for the first time be useful for almost every forecasting purpose including irrigation, power, flood control, pollution control, recreation, skiing, industry, and avalanche hazard forecasting.

Illinois: Minimum tillage gained in acceptance in 1971. Illinois farmers are using some system of conservation tillage on 2 million acres of corn and soybean land. Yields are holding up well, net profits are up, and soil erosion losses are sharply reduced on conservation-tilled or zero-tilled land.

Indiana: RC&D activities on a multicounty basis blossomed in 1971. The active Lincoln Hills RC&D Project continued to make progress; the Historic Hoosier Hills RC&D Project has been authorized for planning. Local committees moved forward on their own in developing area resources; and two other RC&D applications were submitted. The Hoosier Heartland Association of Conservation Districts and the "Four County" Soil and Water Conservation District Resource Area guided multicounty cooperative efforts in resolving environmental problems. Multicounty organizations fostered by conservation districts now comprise 50 percent of the counties and districts in Indiana.

Louisiana—animal-waste lagoons

Iowa: A major erosion-control law was passed in 1971. Soil erosion and resulting sediment can now be declared a nuisance and must be abated after a written complaint is received by a soil conservation district. Landowners may be required to establish permanent or temporary conservation measures on their land on a cost-sharing basis. District commissioners must adopt standards establishing soil loss limits for soils in their district.

Kansas: Application of conservation practices on farmland continued to be the major SCS activity. During 1971, 8,065 miles of terraces and 8,383 miles of grassed waterways were constructed, 684,034 additional acres were farmed on the contour, and 1,770,515 additional acres were placed under crop-residue management. Proper grazing practices were established on 1,557,235 acres.

Kentucky: Because surface mining continued to increase, 39 conservation districts in eastern Kentucky entered into memorandums of understanding with the Kentucky Department of Natural Resources and SCS to provide technical assistance in planning for storage of sediment and debris from future surface-mine operations.

Louisiana: More than 70 animal-waste lagoons were installed in 1971; this reflects the impact that such disposal systems are making on dairymen in the state.

Maine: Several developments in the past year increased the use made of soil information. The Maine Legislature passed several laws based in part on the standard soil survey and soil suitability ratings. The Maine Environmental Improvement Commission now requires that each developer include as part of his application a soil map of the area proposed for development. FHA and several Maine banks indicate that they no longer loan money to individual builders unless the soils at the proposed building site are rated as suitable.

Maryland: Maryland's 1970 Sediment Control Act helped immensely in controlling erosion in urban areas. This law requires that land development plans be referred to soil conservation districts for approval before building or grading permits are issued. The districts utilized the technical assistance of SCS in evaluating such plans. In 1971 all counties, the city of Baltimore, several municipalities, and both private and public agencies developed sediment-control programs through the interdisciplinary task force approach. These programs were in compliance with the standards and specifications for soil erosion and sediment control in urbanizing areas prepared by SCS in Maryland.

Massachusetts: Major effort was directed toward developing criteria for use in evaluating a quality environment. Pilot projects were instituted to determine environmental quality levels. The determination of a given environmental quality level for a given area is based on the available natural resources and their carrying capacity.

Michigan: Fast-developing Otsego County passed the state's first countywide soil erosion and sediment control ordinance. The local soil conservation district helped in developing the regulations and was given development-plan review and approval responsibilities.

Minnesota: The installation of 99 measures to divert uncontaminated runoff around feedlots and collect polluted runoff in a holding pond was a significant accomplishment in 1971. The 99 installations represent a 100 percent increase in this activity over the past year and reflect the growing concern about pollution and animal-waste recycling. To date 158 measures have been installed.

Mississippi: A coordinated program to update the objectives of conservation districts

was completed last year. Fifty-seven district programs were modernized. Not only did this statewide activity strengthen the districts, but also it added new working partners to the conservation program, namely, nearly 1,000 local leaders who helped with the overall planning and who have assumed continuing responsibility for seeing that the updated programs are carried out. In addition, about 30 of the county programs were published in brochure form and circulated to local urban and rural leaders, attracting countywide publicity and attention.

Missouri: In 1971, 137 livestock producers asked SCS for help in planning and designing animal-waste disposal systems. This compares to only half a dozen similar requests in 1970. District conservationists and area engineers have designed 88 of these systems. Of this number, 51 were staked and 35 were completed during 1971.

Montana: Tall wheatgrass barriers on 30-foot spacings were established on more than 4,000 acres of erosive soils in Montana. The practice, which may be applicable to large areas of the Northern Great Plains, reduces soil erosion and conserves moisture.

Nebraska: Animal-waste disposal systems will be mandatory under a new law by December 31, 1972. Consequently, many operators want to put their lots in order before then. SCS, working with the Nebraska Department of Environmental Control, certified more than 1,300 lots as not needing additional waste-control facilities. SCS completed engineering systems for 193 lots. Construction got underway on 96 lots.

Maryland—sediment

Nevada: In 1971, SCS gave technical support through the Central Nevada RC&D Project to the comprehensive planning effort of the Central Nevada Development Authority. The Authority completed an economic base study and resource inventory that incorporates much of the original data and objectives of the RC&D plan. SCS contributed to the study by supplying such information as soils-irrigability maps, an economic evaluation of irrigation potential for each valley, and an economic demand analysis on high-priority water-based project measures.

New Hampshire: To prevent pollution of surface waters and protect water supplies, state laws were amended in 1971 to require all land owners and developers to obtain soil survey data from SCS or equivalent as part of an application for construction of sewage- or waste-disposal systems. SCS answered more than 3,100 requests for such data throughout the state in 1971.

New Jersey: This state took a big step forward in 1971 in its goal of establishing statewide erosion- and sediment-control regulations. A committee organized by the New Jersey Secretary of Agriculture recommended that (1) SCS standards for erosion control, after appropriate revisions, should be adopted by the state, (2) erosion control should be incorporated into the state land-use planning law, and (3) erosion-control ordinances should be enacted by all municipalities.

New Mexico: Minimum loss of soil on millions of acres of New Mexico rangeland was proof of the value of planned grazing systems and range management under the Great Plains Conservation Program during the 1970-71 drought. Oldtimers observed last winter and spring that the loss of topsoil was only a fraction of what it was on the same land during the Dust Bowl months of the 1930's. Climatic conditions were similar if not worse in some areas during 1971, but conservation measures kept erosion under control.

New York: SCS developed a method for inventorying gross soil erosion and computing the sediment delivered to streams and lakes. The Erosion and Sediment Inventory (EASI), sponsored by each of the conservation districts in New York, will be made at the subriver basin level. EASI will include such data as the critical sources of sediment, gross soil erosion by land use in tons, cost of sediment damages, where to find assistance to control

Montana—wheatgrass barriers

erosion and sediment, and the economic benefits of recommended controls. Thirty-five conservation districts are conducting their inventory this winter. The rest of the districts will complete theirs next winter.

North Carolina: The state's 1971 General Assembly was so concerned about natural resources that it has been called "The Environmental Legislature." The assembly passed urban erosion control measures enabling Wake County (suburban Raleigh), Forsyth County (Winston-Salem), and the city of Raleigh to enact local ordinances; created a study group to report back to the 1973 Legislature on statewide legislation in the same field; and passed a mining act that provides for technical assistance from conservation districts in developing and implementing mine-reclamation plans.

The assembly also passed legislation that will reduce about 370 state agencies to about 20 by 1975 and legislation reorganizing the State Soil and Water Conservation Commission. District supervisors replace the director of Extension Service, the state forester, and the director of the Experiment Station on the commission. These, together with the SCS state conservationist, will now serve in an advisory capacity. In October 1971, the Governor established the Department of Economic and Natural Resources, which takes in the Soil and Water Conservation Commission and several other agencies.

North Dakota: The approval for operations of the Lewis and Clark 1805 RC&D Project last January was one of the major conservation accomplishments in North Dakota during 1971. Over and above its value to the more than 4 million-acre area it serves, the project did much to introduce the RC&D concept to the state.

Ohio: SCS in Ohio placed greater emphasis on providing technical assistance to units of government and other decision-making bodies. During the year, SCS assisted about one-third of the slightly more than 3,000 units of government in Ohio. A number of cities passed ordinances requiring a soil and water evaluation where land-use changes are proposed.

Oklahoma: The Oklahoma Legislature broadened the responsibilities and authorities of conservation districts by completely rewriting the State Conservation District Law. Significant changes are: (1) the statement of policy now includes all renewable natural resources; (2) the conservation district now is the primary local unit of government with responsibility for conservation; (3) all qualified voters in a district now are eligible to vote for district directors; (4) counties now have authority to appropriate money for districts from the county general fund; and (5) districts now have authority to prepare and keep current a long-range program for the conservation of all their renewable natural resources.

Oregon: Progress in coordinated resource planning was especially significant during 1971. Under the four-way teamwork of the Forest Service, Bureau of Land Management,

soil conservation districts, and the Soil Conservation Service, the resource program in the ranching areas of Oregon considers all major resources and land uses including grazing, timber, wildlife, and watersheds.

Pennsylvania: The state's Clean Streams Law as amended in 1971 designates sediment as a pollutant, so landowners now may be required to correct pollution-causing situations. Landowners, however, who have applied and maintained conservation plans developed by their conservation district and SCS are to be excluded from the penalties of the law if the pollution results from a natural occurrence.

Rhode Island: One of the more unique activities of the past year was the SCS participation in designing a 40-acre outdoor classroom that features a bubbling stream, land ranging from woods to wetlands, and a Cherokee Indian chief as a lecturer. The conservation plan for the South Kingstown classroom includes a 4-acre wildlife marsh, a trail system with lecture stations, and plantings for wildlife.

South Carolina: An act authorizing the governing body of each county to establish a sediment-control program was enacted by the General Assembly and approved by the Governor last April. The act specifically assigns the responsibility for approval of sediment-control plans to the local conservation district.

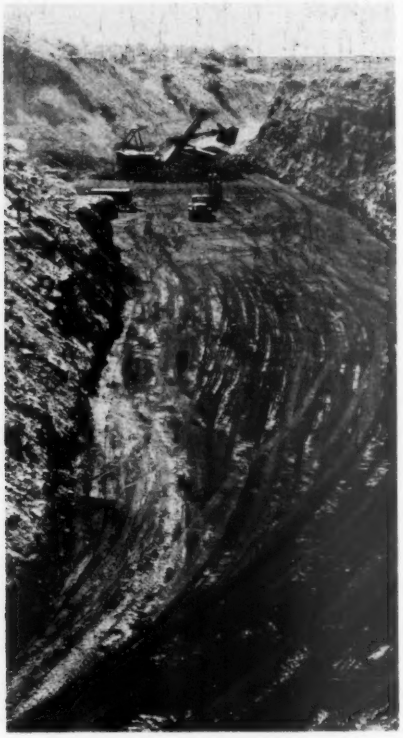
South Dakota: To provide guidance in the handling, storing, and disposition of animal wastes from confined feeding areas, SCS developed three separate technical standards: for feedlot waste control facilities, for animal-waste lagoons, and for holding tanks for storage of animal wastes. SCS completed the design for 100 waste control systems, 40 of which have been installed.

Texas—minimum tillage

Virginia—water

Tennessee: The Chickasaw-Metropolitan Surface Water Management Survey, completed in June 1971, stimulated action by both local and state governments in solving resource problems. Out of this USDA Type IV river basin survey, which takes in a million acres in seven counties in southwest Tennessee and northwest Mississippi, came a watershed work plan for Nonconnah Creek. The $95,000 cost of developing the work plan was financed jointly by the state, the city of Memphis, and Shelby County. Three flood-plain information reports, developed during the survey, were adopted by the Memphis and Shelby County Planning Commission. The Tennessee Legislature passed an act creating the Chickasaw Basin Authority and authorizing nonfederal costs of water-resource projects that are a part of the comprehensive river basin plan to be shared equally by state and local governments. Memphis State University is providing leadership in implementing the basin plan.

Texas: The increase in minimum-tilled acreage was notable. In 1968, no minimum tillage was reported in the state; in 1969, this practice was applied on 1,508 acres; and in 1970, on



West Virginia—surface mines

8,897 acres. Last year, 59,037 acres were minimum tilled. SCS in Texas gave technical assistance to 2,231 units of government in 1971. Inventories and evaluations provided for resource planning increased by 60 percent over last year.

Utah: Planning animal-waste storage facilities was a major conservation activity in 1971. These temporary storage facilities—bunkers for solids and concrete pits for liquids—require approval by the Utah State Department of Agriculture, the Bureau of Environmental Health, Extension Service, Agricultural Stabilization and Conservation Service, and SCS. This multiple approval avoids future problems and costs for the dairyman and feedlot operator. Of the 156 applications for technical assistance received by SCS in 1971, 56 were approved for construction; 39 facilities were completed, and a number of others are under construction.

Vermont: SCS in 1971 was drawn into close cooperation with the newly created Environmental Board and District Environmental Commissions. SCS provides soil data and interpretations and onsite evaluations. The value of the soil survey program to both industrial and residential development has been firmly established.

Virginia: In 1970 the General Assembly authorized the Virginia Soil and Water Conservation Commission to make loans to districts and other legal subdivisions of the state for water-storage facilities for immediate or future use. The first loans under this authority were approved in 1971.

Washington: Many counties established new criteria to determine the value of open space. More and more county officials and planning commissions, working with conservation districts throughout the state, asked for interpretations of soils, plants, and related data to keep up with revisions of county plans. County assessors increased their use of soil surveys and land-capability interpretations in classifying land uniformly.

West Virginia: Preplanning for sediment control in surface mining areas was initiated in 1971. In cooperation with conservation districts, SCS people worked directly with mine operators and Department of Natural Resources inspectors in planning sediment- and erosion-control structures, diversions, waterways, placement of spoil, and establishment of vegetation.

Wisconsin: The Columbia County Soil and Water Conservation District rescued a multimillion dollar beef-feeding operation through the use of soils information. The industry, economically important to the entire county, was about to be closed down by the state's pollution enforcement agency for fouling the waters of the Crawfish River. The SCS work unit at Portage helped to relocate the entire operation on a safer site. To insure that pollution would not occur in the future, a complete animal-waste control system was installed.

Wyoming: A major breakthrough was achieved in 1971 in restoring open-pit mining areas and other disturbed land surfaces. A 1969 state law requires a permit from the Commissioner of Public Lands for each land-surface disturbance. During the past year the commissioner referred all mining companies to conservation districts for SCS recommendations. SCS is working with 10 companies in developing detailed plans for land restoration; three of these companies are carrying out extensive plant-material trials in difficult planting areas. ♦

Review

Books

A Good Life for More People: The Yearbook of Agriculture, 1971. EDITED BY JACK HAYES. *USDA. 391 pp., illus. $3.50.*

The recently published 1971 Yearbook makes a major contribution to the nation's most important debate.

At issue is the shape of the future, and the terms of the debate embrace the questions of national priorities, population growth, technology, and environmental quality.

With 74 percent of the nation now living on 2 percent of the land, it is reasonable for this volume to spotlight the concrete problems and the specific potentials for growth and development in America's rural towns and countryside.

This Yearbook is again a collaborative public-private undertaking. The fusion of viewpoints and the variety of rich data sources are here not only effective but symbolic of the need for national, regional, and local planning to become more comprehensive and more finely tuned to social and natural truths.

The Yearbook is distinguished by the sustained high level of its articles. SCS contributions include articles by Charles E. Kellogg, F. Glennon Loyd, Dirk van der Voet, A. A. Klingebiel, Harold Ryan, Carolyn Johnston, R. C. Barnes, Jr., B. D. Blakely, Eugene C. Buie, R. Neil Lane, and Wallace L. Anderson. Some 25 scholars from American and transatlantic colleges and universities are represented.

The volume, however, is more than a collection of separate pieces. The sensible arrangement of well-planned essays combines to build up and flesh out a national perspective on American planning that is timely and will continue to have merit. Its readers will want to read this volume through.—HOWARD M. GOLDFINGER, *Information Division, SCS, Washington, D.C.*

New publications

How to Build and Save Beaches and Dunes. BY JOHN A. JAGSCHITZ AND ROBERT C. WAKEFIELD. *1971. University of Rhode Island Agr. Expt. Sta. Bull. 408 (Rhode Island Agr. Expt. Sta., Woodward Hall, Univ. of Rhode Island, Kingston, Rhode Island 02881). 12 pp., illus.* Applicable from Maine to North Carolina and along the Great Lakes, presents methods for preserving the shoreline with fencing and beachgrass. Tells how brush, discarded Christmas trees, and snow fences can trap sand for dune building. Recommends American beachgrass as the best grass for sand dune stabilization.

Handbook of Soil Survey Investigations Field Procedures. *1971. USDA Soil Conservation Service.* [88] *pp., illus.* A guide to the study of soils in the field. It includes observations on the site, gross and detailed morphology, and the mineralogical, chemical, and physical observations and tests that can be done in the field.

Pollution Control Practices for Agriculture. *1971. USDA PA-971.* [4] *pp, illus.* Explains briefly the U.S. Department of Agriculture's Rural Environmental Assistance Program and how agricultural pollution control costs can be shared.

Factors Affecting the Accumulation of Nitrate in Soil, Water, and Plants. BY FRANK G. VIETS, JR., AND RICHARD H. HAGEMAN. *1971. USDA Agriculture Hbk. 413. 63 pp., illus. $0.65.* Presents the nitrate problem and points out that some environmentalists and ecologists fear that a nitrogen crisis is resulting from use of commercial nitrogen fertilizers and the release of nitrogen oxides by high temperature combustion in power plants and internal combustion engines and that the high nitrate content of many water sources and of some foods, particularly some canned baby foods, is cause for real alarm. The conclusion reached in this handbook from "evaluation of the available information on nitrate in soil, water, foods, and feeds is that the potential for nitrate accumulation does not pose a threat of an environmental crisis. There is no indication of widespread upward trends of nitrate concentrations in foods, feeds, surface or ground water." A comprehensive citation of the literature appears in the handbook.

Trout Ponds for Recreation. BY L. DEAN MARRIAGE, ADREY E. BORELL, AND PAUL M. SCHEFFER. *1971. USDA Farmers' Bull. 2249. 13 pp., illus. $0.15.* This bulletin, superseding Farmers' Bulletin 2154, *Trout in Farm and Ranch Ponds,* contains helpful information for those who are planning to build a trout pond. The only indispensable ingredients are a dependable source of good-quality cold water, soil that holds water without excess seepage, and a location free from the danger of heavy runoff or flooding.

Hydrology. *Rev. 1971. USDA Soil Conservation Service National Engineering Handbook, Sec. 4.* [675] *pp., illus. $5.75 (Supt. of Documents, Washington, D.C. 20402).* Contains methods and examples for studying the hydrology of watersheds, for solving special hydrologic problems in planning watershed protection and flood prevention projects, for preparing working tools needed to plan or design structures for water use, control, and disposal, and for training personnel newly assigned to activities that include hydrologic studies.

Soil and Water Conservation Activities for Scouts. *1971. USDA PA-978. 30 pp., illus. $0.25.* Supersedes PA-348, *Soil and Water Conservation Activities for Boy Scouts.* Describes 22 soil and water conservation projects to help Scouts understand some conservation principles. Some of the projects are: making soil artificially; determining soil particle size; and finding out how organic matter helps soil structure, how much sediment a stream carries, how capillary water moves through soil, how cover affects soil loss, how mulch prevents soil loss, what contouring does, and how fertilizer affects plant growth.

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Effects of Weed Control and Fertilization on Botanical Composition and Forage Yields of Kentucky Bluegrass Pasture. By Elroy J. Peters and J. F. Stritzke. *1971. USDA Tech. Bull. 1430. 28 pp., illus. $0.20.* Study to evaluate the effects of 2,4-D and mowing, combined with three fertilizer levels, on the botanical composition and desirable forage production of a Kentucky bluegrass pasture.

Regional Variations in Economic Growth and Development With Emphasis on Rural Areas. By Clark Edwards, Robert Coltrane, and Stan Daberkow. *1971. USDA Economic Research Service Agr. Econ. Rpt. 205. 185 pp., illus.* Problems associated with rural economic development, involving maldistributions of population, income, and employment, suggest the need for statistical indicators of rural area growth and development. Four hundred and eighty-nine multicounty trading areas, which include all counties in the 48 contiguous states, were aggregated into five urban-orientation groups. This report gives the findings.

Range Improvement Methods and Environmental Influences in the Northern Great Plains. By Walter R. Houston. *1971. USDA Agricultural Research Service Production Res. Rpt. 130. 13 pp., illus. $0.15.* Reports on a study comparing several treatments and combinations of treatments for range improvement in eastern Montana. The experimental treatments included protection from grazing, seeding, range pitting alone and with seeding of alfalfa and with nitrogen fertilization, and different rates of fertilization.

The Water Encyclopedia. Edited by David K. Todd. *1971. Water Information Center, Manhasset Isle, N.Y. 550 pp. $28.* A practical reference volume containing more than 200,000 facts about climate, hydrology, surface- and ground-water resources, water use, water needs, and water quality. Also contains a directory of water resource agencies.

The Water We Live By—How To Manage It Wisely. By L. A. Heindl. *1971. Coward-McCann, 200 Madison Ave., New York, N.Y. 127 pp. $4.29.* Outlines some basic principles for the sound management of water resources. Gives numerous examples of difficulties and catastrophies that can result if these principles are ignored. Discerning enough so young readers are shown the interlocking problems involved in water management.

Meetings

January

12-13 National Council of Farmer Cooperatives, Phoenix, Ariz.
19-22 American National Cattlemen's Association, Denver, Colo.
20-22 National Woolgrowers Association, Phoenix, Ariz.
23-27 National Association of Home Builders, Houston, Tex.

February

3-5 Catfish Farmers of America—Fourth Annual Convention and Trade Show, Dallas, Tex.
5-7 Water Resources Congress, St. Louis, Mo.
6-11 Society for Range Management, Washington, D. C.
12-16 American Association of School Administrators, Atlantic City, N. J.
13-17 National Association of Conservation Districts, Washington, D. C.
16-18 Land Improvement Contractors of America, Phoenix, Ariz.
27-29 Sprinkler Irrigation Association, Annual Technical Conference, Denver, Colo.
28-March 2 National Farmers Union, Houston, Tex.

March

3-9 Associated General Contractors of America, Houston, Tex.
5-8 Association for Supervision and Curriculum Development, Philadelphia, Pa.
5-9 Society of Toxicology, Williamsburg, Va.
8-11 American Camping Association, New York, N. Y.
10-12 National Wildlife Federation, Mexico City, Mexico.
12-15 The Wildlife Society, Mexico City, Mexico.
12-15 North American Wildlife and Natural Resources Conference Mexico City, Mexico.
12-18 National Wildlife Week.
25-27 Western Audubon Conference, National Audubon Society, Asiloman Beach State Park, Calif.
25-29 American Pulpwood Association, Atlanta, Ga.